its extended use in photometry. But in a sense it appears fortunate, since it suggests that one might conceivably prepare selenium in such a way as to follow out almost exactly the behaviour of the eye as regards the perception of luminous energy.

## NOTES.

THE typhoon which recently visited Japan, isolated Tokyo telegraphically from September 22 to 24, and carried widespread devastation, is said to have been the severest experienced in half a century. Accounts so far are meagre, but according to reports already received the loss of life and damage to property afloat and on shore are appalling. The storm appears to have been most violent in the middle of the south coast. Typhoons are revolving storms of tropical origin that may occur in Far Eastern seas—the North Pacific or the China Seas—during any month of the year. In Japan and its neighbourhood they are, as a rule, confined to the months of June to September inclusive, and are most frequent in September. In general, all tropical revolving storms follow a parabolic track. The typhoons that visit Japan in September usually originate in the Pacific south-eastward of Formosa, move N.W. by W., recurve when abreast of that island, and then take the direction of the Japan Sea. Algue divides the tracks of typhoons in the Far East into two classes—those of the Pacific, which do not cross the meridian of 124 E., and those of the China Sea. A typhoon is said to travel rapidly when its rate of motion exceeds twelve nautical miles an hour; if its rate of motion be less than six miles an hour it is said to travel slowly. The September typhoons come under the former category.

DURING the recent meeting at Geneva of the fourteenth International Congress of Prehistoric Anthropology and Archæology, an important piece of work was carried out by the Committee for the Unification of Anthropometric Measurements. The committee (or commission) included representatives of most of the European countries, as well as of the United States of America, and the number amounted to about thirty. Dr. Duckworth (of the Cambridge Anthropological Laboratory) was one of the three secretaries appointed to prepare a report of the proceedings. The secretaries made out a report, which was adopted at the final meeting of the commission, and was confirmed at the concluding meeting of the congress. The official report will be published in French, but it is intended to issue translations in English and in German simultaneously, if possible, with the official version. The illustrations are to be uniform in all three publications. Dr. Duckworth is at present engaged (for the third year in succession) upon excavations at Gibraltar, but he will be pleased to give further information as to the above-mentioned report after his return to England early this month. Communications should be addressed to the Anthropological Laboratory, New Museums, Cambridge

A CONFERENCE of members of the Museums Association and of others interested in similar work will be held on the afternoon of Thursday, November 7, at the Manchester Museum, for the purpose of discussing subjects of common interest to those concerned in the work of museums, art galleries, and kindred institutions.

THE Huxley lecture will be delivered at Charing Cross Hospital Medical College on Thursday, October 31, by Prof. Simon Flexner, of the New York Rockefeller Institute, on "Recent Advances in Science in relation to Practical Medicine." On the same day the extensive new laboratories of public health and bacteriology, recently formed by the school and taken over by the University of London as the public health and bacteriological departments of King's College, will be formally opened and handed over to the University.

ON the suggestion of Mr. Mark Sykes, M.P., Sir Tatton Sykes has kindly sent for exhibition in the Hull Museum the objects of prehistoric date in his possession. These include the contents of the famous Duggleby Howe burial mound, which contained flint and bone weapons and implements of exceptional interest; a prehistoric jet necklace containing several hundred beads; a fine series of prehistoric implements in flint, sandstone, bronze, &c., and some earthenware vases taken from British burials on the Yorkshire Wolds.

THE extensive collection of east Yorkshire and north Lincolnshire diatoms, made by the late R. H. Philip, of Hull, also the specimens which have been figured and described in the well-known work by Mills and Philip, together with his microscope, a fine collection of microscopical slides (including several made by Robt. Harrison, a former Hull microscopist), and his scientific books, have been presented by Mrs. Philip and family to the Hull Museum. The collection of slides contains more than 3000 specimens, and among the books are such important works as "Diatomées Marines de France," by MM. H. et M. Peragallo; "A Treatise on the Diatomaceæ," by Van Heurck; "Diatomaceæ Germaniæ," by H. von Schonfeldt; "British Desmidiaceæ," by W. West, and numerous other volumes dealing with microscopy.

THE British Fire Prevention Committee opened its autumn session on September 25 with two important series of official fire tests, namely, (1) a series of twenty tests with ordinary celluloid kinematograph films *versus* a non-inflammable celluloid film; and (2) an extensive series of some twenty-five fire tests as to the possibility of extinguishing petrol fires, celluloid fires, and similar outbreaks by the application of chemical foam. Reports upon the tests, which were witnessed by representatives of about thirty Government departments and other institutions, will be published by the committee later.

THE next meeting of the Australasian Association for the Advancement of Science is to be held at Melbourne in the University, from January 7 to 14, 1913, under the presidency of Prof. T. W. E. David, C.M.G., F.R.S., Sydney. The presidents of the various sections are as follows:—A, Astronomy, Mathematics, and Physics, Prof. H. S. Carslaw, Sydney; B, Chemistry, Prof. C. Fawsitt, Sydney; C, Geology and Mineralogy, Mr. W. Howchin, Adelaide; D, Biology, Prof. H. B. Kirk, Wellington, N.Z.; E, Geography and History, Hon. Thos. M'Kenzie, Wellington, N.Z.; F, Ethnology and Anthropology, Dr. W. Ramsay-Smith, Adelaide; G1, Social and Statistical Science, Mr. R. M. Johnston, Hobart; G2, Agriculture, Mr. F. B. Guthrie, Department of Agriculture, N.S.W.; Subsection, Veterinary Science, Prof. Douglas Stewart, Sydney; H, Engineering and Architecture, Colonel W. L. Vernon, Sydney; I, Sanitary Science and Hygiene, Dr. T. H. A. Valintine, Wellington, N.Z.; J, Mental Science and Education, Sir J. Winthrop Hackett, K.C.M.G., Perth, W.A. In addition to the meetings of the sections, arrangements are in progress for evening lectures and entertainments, and for excursions to places of interest. Full particulars can be obtained from the permanent hon. secretary, Mr. J. H. Maiden, Botanic Gardens, Sydney. The hon. treasurer for the Melbourne meeting is Mr. G. H. Knibbs, C.M.G., Melbourne, and the general secretary Dr. T. S. Hall, University, Melbourne.

DR. W. E. GARFORTH has recently presented to the University of Leeds and placed in the geological department a large case containing specimens which show the structures of numerous seams of coal from Yorkshire, Lancashire, Staffordshire, and Australia. The lower part of the case contains coal-balls, or bullions, which are found in the Halifax Hard Bed of Yorkshire and its equivalent, the Bullion Mine, in Lancashire. The coal-balls are simply masses of vegetable material which were impregnated with calcium carbonate while the tissues were still in a fresh condition, and so preserved during the subsequent changes which the surrounding vegetable matter underwent in the process of its conversion into coal. Many of the microscopic sections of these coal-balls are of an extraordinary size, measuring 8 in. by 6 in., and show the structure of the plants most beautifully. The centre of the case is occupied by a series of models illustrating the structure of Lepidostrolius, the "fruit" of Lepidodendron and its allies, showing the position of the megasporangia and microsporangia. Perhaps the most interesting sections are those from coal seams in which explosions have occurred, such as those from No. 3 Bank Pit, Atherton, near Bolton. These were prepared with the view of ascertaining whether any connection could be traced between the microscopic structure of the coal and the character of the coal dust, and were the first sections to be prepared for that purpose. The whole of the sections were made by the Lomax Palæobotanical Co., Bolton, and the case was exhibited at the Franco-British Exhibition.

IN *L'Anthropologie* for June-July-August, MM. C. Maska, H. Obermaier, and H. Breuil describe a remarkable discovery of an ivory statuette of a mammoth found near the village of Prerau, not far from the battlefield of Austerlitz. This site has already supplied a vast number of remains of extinct animals and flint implements of the palæolithic period. The present figure measures 116 mm. in length and 96 mm. in breadth. It represents the animal with full details of head and trunk. It is referred to the Salutrian Age, and is thus much older than the carvings of the animal in the flat from La Madelaine, Combarelles, Font-le-Gaume, and Pindal in Spain, of which drawings for the purpose of comparison are supplied in the article. This is the finest representation hitherto found of this great beast which flourished for ages in the steppes and prairies of ancient Europe, and was hunted for food by its early races.

THE *National Geographic Magazine* for July devotes one of its usual well-illustrated articles to an exploration of the little-known parts of Panama by Mr. H. Pitter. The Guaymies, one of the aboriginal tribes, who were formerly under the influence of Roman Catholic missionaries, have now reverted to their ancient customs and manner of life. Among the Suna-Cunis, while some of the men have visited the United States and Nova Scotia, and have thus acquired some degree of culture, primitive habits are perpetuated among the women, who have not as yet been allowed a glimpse of the outer world. The article, as a whole, gives an instructive picture of the gradual acquirement of a new phase of culture in its varied forms.

IN the report of the Warrington Museum for the year ending June 30, the director and librarian records some progress in all departments, but no change in the programme, of that institution.

IN an article on type-specimens, published in the August number of *The Victorian Naturalist* (vol. xxix., p. 59), Mr. F. Chapman proposes the new term "tectotype" for specimens, fragmentary or otherwise, selected to illustrate the external or internal microscopic characters of a species or genus. Such a specimen may be the section of a tooth, a flake of a shell, a slice of a foraminifer, or a preparation from a fossilised leaf.

PROF. W. L. MCATEE commences a long article in the Proceedings of the Philadelphia Academy for June on the experimental method of testing the efficiency of warning and cryptic coloration in protecting animals from their enemies by the statement that the theories on this subject long preceded any knowledge of the food-preferences of insectivorous species sufficient to justify such speculations. At the conclusion he states that the behaviour of animals in captivity, as regards food, does not afford trustworthy indications of what they would do in the wild state when offered similar food, thereby showing that the results of such experiments do not indicate the parts the animals might play in natural selection. He therefore urges that the time expended in making such experiments might be better employed in collecting trustworthy data in regard to the food-habits of animals in the wild condition, as "the result would be truth, not imaginative inferences from abnormal behaviour."

IT is a well-known fact that in certain aquatic hemipterous insects belonging to the genera Zaitha and Serphus, the females—in Europe, Japan, the West Indies, and America—are in the habit of attaching their eggs to the backs of their apparently unwilling partners, in such a manner as to form a complete coating. According to an article by Prof. J. F. Abbott in the September number of *The American Naturalist*, a somewhat analogous, although more remarkable, instance of abnormal "nursery arrangements" occurs in the case of a North American hemipterous insect (*Rhamphocorixa balanodis*) belonging to the family Corixidæ, which is related to the Notonectidæ, as represented by the well-known "water-boatman." In 1910 it was observed that many of the crayfish (*Cambarus immunis*) near Colombia, Mo., were more or less completely coated with the eggs of this insect, each egg being imbedded in a small cup fixed to the shell of the crayfish. Each crayfish carried hundreds of eggs, and as each female Rhamphocorixa lays comparatively few, several insects must have cooperated in investing the crayfish. It is suggested that the coating of eggs renders the crayfish less conspicuous than in its ordinary condition, just as crabs carrying colonies of algas, sponges, or sea-anemones probably profit in some manner by the investiture.

WE have received from Dr. Friedrich Konig, of Krailling-Planegg, near Munich, a small pamphlet on the reconstruction of extinct vertebrate animals, with photographs of models which he has prepared in accordance with the principles he explains. He emphasises especially the important aid afforded by the new kinematograph films of wild animals in motion, and points out how much less hypothetical are restorations made with our present knowledge than those which were attempted some years ago. His pamphlet forms an interesting summary of the whole subject, its problems and difficulties, with full references to all the important literature. Among his own restorations that of Diplodocus is particularly striking, for he has tried to avoid the appearance of a sleek pachyderm by assuming the presence of a series of glands beneath the skin, which give the dorsal region of the body a segmented aspect.

IN the September number of *The American Journal of Science* Prof. Roy L. Moodie publishes a detailed description of the remains of *Eobatrachus agilis* from the Upper Jurassic of Wyoming, U.S.A., and confirms the opinion of the late Prof. O. C. Marsh that they represent a true anourous amphibian. Prof. Moodie finds that the bones are closely similar to those of a modern toad, and he comments on the great interest of the discovery of so highly specialised an animal in rocks so ancient as those of the Jurassic period. He overlooks the fact, however, that a well-preserved skeleton of a frog, *Palaeobatrachus gaudryi*, is already known from the Upper Jurassic of northern Spain (L. M. Vidal, *Mem. Real Acad. Ciencias de Barcelona*, vol. iv., No. 18, 1902).

THE Rev. M. Saderra Maso, the well-known student of the Philippine earthquakes, finds that most of the earthquakes in southern Luzon originate along three great fractures, two of which lie to the east and west of the island, and are roughly parallel to the coast-lines, while the third, and most important, traverses the Taal volcano (the seat of the disastrous eruption of 1911), and runs in a north-north-easterly direction, passing some miles to the east of Manila. The earthquakes which originate in the south-western part of this line are characterised by relatively long duration and rather slow undulations of large amplitude, while those which proceed from the north-eastern part of the fracture are more dangerous, owing to the rapidity of their vibrations. It is in the latter part of the fracture that the destructive earthquakes of Manila have for the most part originated.

ALL the available space in *Symons's Meteorological Magazine* for September is devoted by Dr. Mill to an account and preliminary map of the distribution of rain in East Anglia on August 26 and 27, which was altogether unprecedented for a cyclonic storm in that part of Great Britain. The relation of the track of the depression to the rain area was similar to that of the great Irish fall of August 24–26, 1905 ("British Rainfall," pp. [110]–[114]). On the morning of August 26 the Daily Weather Report issued by the Meteorological Office showed a depression off the North Foreland; by 6 p.m. it had moved northwards and deepened off the most easterly part of the Norfolk coast, and during the night turned to the right, across the North Sea. The storm seems to have been central close to Norwich, and the area of torrential rain lay in the north-east of Norfolk. The more important facts relating to the heavy rainfall are given in letters from several of Dr. Mill's staff of observers. Among these Mr. J. H. Willis, of Norwich, took the trouble to read his gauge twelve times between 4 a.m. of August 26 and 4 a.m. of August 27; he recorded 6·32 in. in the twelve hours to 4 p.m. of August 26, and a further inch exactly in the following twelve hours. Only 0·04 in. fell between 4 and 9 a.m. on August 27, making 7·36 in. in twenty-nine hours. Although the twenty-four hours in question do not count as a "rainfall day" (twenty-fours ending at 9 a.m.), and the amount does not compare with other falls, it has not been surpassed in the British Isles on more than two or three occasions. The remarkable amount of 8·09 in. was recorded at Brundall, five miles east of Norwich, for the two days. Dr. Mill computes that the county of Norfolk, with an area of 2044 square miles, had a general rainfall of probably 4·88 in., which would be equivalent to twice as much water as is contained in Windermere, the largest of the English lakes.

THE Journal of the Franklin Institute for September contains an account of some experiments on the electrical precipitation of solid and liquid matter suspended in gases by Mr. W. W. Strong, of the department of industrial research of the University of Pittsburg. The suspended matter was obtained by blowing lime dust or the smoke produced by burning soft coal or the spray from a nozzle through which alcohol, ether, or toluol was forced, into the space between an earthed electrode and one connected to six different types of high-tension apparatus. The experiments show that the problem of precipitating smoke is identical with that of removing dust, and that the corona discharge is much more effective than the brush discharge, especially with large velocities of the gas containing the suspended particles. With this type of discharge the size of the precipitating chamber may be materially reduced. The ionic currents due to secondary ionisation appear to play a more important part in the process than has been supposed.

In an interesting note in the *Gazzetta chimica italiana* (vol. xlii., ii., 85) by F. Calzolari, the relationship between solubility and electro-affinity is discussed with especial reference to the chlorates and perchlorates of the alkali-metals, potassium, rubidium, and cæsium. According to the electrochemical theory of Abegg and Bodländer, the solubility should diminish, in the case of these salts, as the atomic weight of the metal increases, so that the solubility of the rubidium salts should be intermediate between the solubilities of those of potassium and cæsium; actually, however, it was found that at 20° the solubility of the cæsium salts is intermediate between those of the potassium and rubidium compounds, whilst, owing to the crossing of the solubility curves at higher temperatures, the order of the arrangement is entirely different at different temperatures. The case is apparently similar with the nitrates. The solubility of these salts, which has been cited in favour of the theory of electro-affinity, is in reality not in accord with it.

*The Biochemical Journal*, vol. vi., part 3, contains an important paper by Messrs. E. S. Edie, W. H. Evans, B. Moore, G. C. E. Simpson, and A. Webster from the laboratories of biochemistry and tropical medicine of the University of Liverpool, on the question of the cause and curative treatment of beri-beri and polyneuritis. An alcoholic extract of ordinary yeast, after removal of the alcohol at a low temperature, is extremely active in curing the convulsions and lameness of birds suffering from polyneuritis. An organic base, to which the name *torulin* has been given, has been isolated from this extract; its nitrate has apparently the composition, $C_7H_{16}O_2N,HNO_3$, forms feathery crystals, and is not precipitated by basic lead acetate, although thrown down by phosphotungstic acid. The alcoholic yeast extract loses its activity on warming, and the active substance is apparently easily destroyed by heat. Experiments are in progress to ascertain whether birds can fully maintain their weight and activity on a diet of polished rice, which ordinarily produces neuritis, when taken in conjunction with small doses of torulin; or whether it will only prevent the onset of convulsions or nervous changes without being able to maintain full nutrition.

*The Builder* for September 27 gives some interesting particulars of ancient iron beams in India. At the Black Padoga of Orissa, Kanarak, there are some very large forged iron beams; the two largest members as described by Mr. H. G. Graves, of Calcutta, are 35 ft. long by 8 in. square, and 25·5 ft. long by 11 in. square. The broken end of one of them indicates that the method of construction was by the welding up of billets. The age of the temple has been placed by some as early as the ninth, and by others as late as the thirteenth, century. Examination indicates that the small blooms were of 3 to 4 lb. in weight; in some places the blooms appear to have been welded together in strings to form short bars, which in turn were welded into place. No special care seems to have been taken to make the blooms break joint. The beams are nearly all of uniform size, and square in section from end to end. The designers do not appear to have understood the advantage of making the depth of the beam greater than the width. The beams could have been of but little structural value, although they constitute interesting examples of smiths' work.

Commenting on Sir W. H. White's address at the recent International Mathematical Congress, *Engineering* for September 27 states that it is not a little remarkable how little information mathematics is able to give us as to the strength of any engineering structure. In many cases, the service which mathematics renders is to furnish laws of comparison by which, without knowing the actual limits of the stresses, we can conclude that a structure which has successfully met certain conditions may be used as a basis for designing another similar structure, larger or smaller, to meet similar conditions. Perhaps the greatest service that mathematics can render to the engineer is in directing the course of a series of experiments and in analysing the results observed. There is unquestionably an immense mass of data uselessly pigeon-holed in the archives of manufacturing firms simply and solely because their technical staff are insufficiently equipped with mathematical knowledge to analyse these records effectively, and the art of the engineer and the profits of the manufacturer suffer in consequence.

Messrs. John Bartholomew and Co., of the Geographical Institute, Edinburgh, have published two additional sheets to their "half-inch to mile" map of Scotland. One sheet deals with Berwick and Haddington, the other with Inverness and Spey. The familiar greens and browns associated with this excellent series of reduced survey maps serve admirably to bring out the build of the country depicted, and the points of the compass arranged to show the magnetic variation, with the annual decrease of the variation indicated, is a commendable feature which will be of great assistance to tourists using the map with a compass. The price of the sheet on paper is 1*s*. 6*d*., and on cloth 2*s*.

Several additions have recently been made to the "Home University Library of Modern Knowlege" and to "The People's Books." Messrs. Williams and Norgate have added to the former series, among other volumes, the following books: "The Human Body," by Prof. Arthur Keith, "Electricity," by Prof. Gisbert Kapp, and "The Making of the Earth," by Prof. J. W. Gregory, F.R.S. To "The People's Books" Messrs. T. C. and E. C. Jack have added, with others, the following volumes: "The Evolution of Living Organisms," by Mr. E. S. Goodrich, F.R.S.; "Embryology," by Dr. Gerald Leighton; "Practical Astronomy," by Mr. Hector Macpherson, Jun.; and "Aviation," by Mr. S. F. Walker. It may be hoped that the recent rapid growth of scientific literature for the general reader is an indication of a fuller understanding of the important part which science must take in the work and development of modern States.